Contents of Reply

(1) Examiner's opinion

According to International Search Report and written opinion of International Searching Authority sent on January 18, 2005, the Examiner is of an opinion that the inventions of claims 1 to 7, 17 to 29, 39 to 46, 48 to 50, 52 to 54, 56 to 58, and 60 do not have inventive steps over cited prior art 1 (Japanese Laid-Open Patent Application Publication No. 2002-365427) or cited prior art 2 (Japanese Laid-Open Patent Application Publication No. 2001 – 354966).

Accordingly, the applicant amended claims to make clear distinction between the inventions of the subject application and the invention of the above identified cited prior arts in contents of amendments submitted along with the contents of reply. Below, the applicant argues the inventions defined in amended claims.

(2) Grounds for amendments

Claims 1, 23, 45, 49, 53, and 57 have been cancelled, and dependent claims 2, 8, 17, 24, 30, 39, 46 to 48, 50 to 52, 54 to 56, and 58 to 60 have been rewritten in independent form. Claims 5, 20, 27, and 42 have been incorporated into claims 2, 17, 24, and 39, respectively. Claim 21 has been amended to depend from claim 17, and claim 43 has been amended to depend from claim 39. These amendments are supported by original claims as filed, and do not add new matter.

(3) Reply

3 – 1. Description of the inventions of the subject application

Hereinbelow, the inventions of amended claims 2, 24, 17 and 39 will be described.

The invention defined in amended claim 2 is such that a conductive thin film which is formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented. The invention defined in amended claim 24 is such that a method of fabricating a

conductive thin film comprising: mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together; and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented.

A conductive thin film defined in amended claim 17 is such that a conductive thin film, which is formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of said organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented.

A method of fabricating a conductive thin film defined in amended claim 39 is such that a method of fabricating a conductive thin film comprising: mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of said organic semiconductor compound to form a mixed composition; and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented.

3 – 2. Description of Cited Prior Arts

The cited prior art 1 discloses a polarizer that is formed by dispersing and mixing carbon nanotube into a liquid crystalline compound as a matrix exhibiting a

nematic phase and a smectic phase, etc, and by orienting and aligning the liquid crystalline compound to cause the carbon nanotube dispersed and mixed to be oriented and aligned, and a has high polarization characteristic, a high mechanical characteristic, an environmentally-sound characteristic, etc, and a method of fabricating the polarizer.

The cited prior art 2 discloses a mixed liquid crystal material that includes a first liquid crystal material having high electric filed orientability and exhibiting a nematic phase, and a second liquid crystal material having a charge transport function and exhibiting a smectic phase, and that is separated into the first liquid crystal material and the second liquid crystal material which are homogeneously oriented in a cooling process, and an organic photo refractive element using the mixed liquid crystal material.

3 – 3 Comparison between the invention of the subject application and the inventions disclosed in cited prior arts

3 – 3 – 1 Comparison between the inventions of amended claims 2 and 24 and the invention of cited prior art 1

The inventions defined in amended claims 2 and 24 recite features "a conductive thin film is formed in such a manner that molecules of metallic nanotube or semiconductive nanotube are oriented by orienting molecules of liquid crystalline organic compound having a charge transport function."

According to this features, the molecules of the metallic nanotube or semiconductive nanotube are oriented to a high degree by orientation of the molecules of the liquid crystalline compound while having electric continuity with the molecules of the liquid crystalline organic compound having a charge transport function. Therefore, a high-speed charge-transfer in a long-axis direction within the nanotube molecules and an excellent charge-transfer between the nanotube molecules through the molecules of the liquid crystalline compound having a charge transport function are effectively utilized in a conductive thin film. This makes it possible to obtain a suitable conductive thin film that is high in flexibility and electric conductivity or carrier mobility, as compared to a case where only the organic semiconductor

compound or the nanotube is used.

In other words, the inventions defined in claim 2 and 24 are such that by using the liquid crystalline organic compound having a charge transport function as a second charge-transfer path in the conductive thin film, the charge-transfer between the nanotube molecules is surely achieved in addition to the charge-transfer within the nanotube molecules as a first charge-transfer path, thereby significantly improving the electric conductivity or the carrier mobility of the conductive thin film.

In contrast, the cited prior art 1 only discloses that the molecules of the liquid crystalline organic compound are oriented and aligned to cause the molecules of the carbon nanotube to be oriented and aligned, and does not disclose or suggest "mixing at least the liquid crystalline organic compound having a charge transport function" recited in amended claims 2 and 24, i.e., "using the conductive liquid crystalline compound in the polarizer."

To be specific, the cited prior art 1 illustrates plural examples of the liquid crystalline compound. As the liquid crystalline compound, it is desirable to use a liquid crystalline compound that is high in transparency, fluidity, dispersity, heat resistance, and homogeneity. For example, it is desirable to use biphenyl liquid crystalline compound, or phenylcyclohexane liquid crystalline compound, in particular, ester liquid crystalline compound. According to Rikagaku jiten, fifth edition, CD-ROM published on September 24, 1999 which is before filing of the subject application by Iwanami, a conductive polymer means a generic term of polymer material exhibiting metallic or semiconductive conductivity, and includes a number of conjugated organic polymer or chain conjugated conductive polymer that has a carbon atom chain as a skeleton that is bonded by conjugated double bond (or conjugated triple bond) enabling non-localization of π electrons. And, by adding various donors or acceptors, a charge-transfer complex with conductivity significantly increased because of transfer of the π electrons between matrixes is obtained, exhibiting metallic conductivity. In order to enable the liquid crystalline compound to have a charge transport function as recited in the inventions of amended claims 2 and 24, it is necessary that the liquid crystalline compound have a specific structure to achieve

charge transfer within the molecules, for example, carbon atom chain as a molecule skeleton which is bonded by conjugated double bond (or conjugated triple bond) enabling non-localization of the π electrons. However, the cited prior art 1 only describes that a liquid crystalline compound that is high in transparency, fluidity, dispersity, heat resistance, and homogeneity is desirably used as mentioned above, and does not disclose or suggest a specific structure to achieve charge transfer within the molecules, for example, carbon atomic chain as a molecule skeleton which is bonded by conjugated double bond or the like, enabling non-localization of the π electrons.

Based on the structure of the polarizer disclosed in the cited prior art 1, the molecules of the nanotube is able to be oriented in the conductive thin film and the high-speed charge transfer in the long-axis direction within the nanotube molecules is achieved. But, based on the structure of the polarizer disclosed in the cited prior art 1, both the charge transfer within the nanotube molecules and the charge transfer between adjacent nanotube molecules are not able to be achieved. Even a person skilled in the art is unable to anticipate a technical concept using the liquid crystalline organic compound having a charge transport function in the conductive thin film. For these reasons, the electric conductivity or carrier mobility of the conductive thin film is not effectively improved based on the cited prior art 1.

As should be appreciated from the above, the cited prior art 1 does not disclose or suggest the inventions defined in amended claims 2 and 24. Therefore, the inventions of amended claims 2 and 24 have inventive steps over the cited prior art 1.

3 – 3 – 2 Comparison between the inventions of amended claims 17 and 39 and the invention disclosed in cited prior art 2

The inventions defined in amended claims 17 and 39 recites features "a conductive thin film is formed by mixing an organic semiconductor compound having a first liquid crystalline phase of a higher orientational order at a high temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase so as to contain 70 to 98 wt% of the organic semiconductor compound to form a mixed composition and

orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented."

According to these features, the molecules of the organic semiconductor compound is oriented to a high degree by mixing an organic semiconductor compound having a first liquid crystalline phase of a higher orientational order at a high temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order so as to contain 70 to 98 wt% of the organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range. So, desired charge transfer in the long-axis direction of the organic semiconductor compound is effectively utilized in the conductive thin film. This makes it possible to obtain a suitable conductive thin film that is high in flexibility and electric conductivity or carrier mobility, as compared to a case where only the organic semiconductor compound is used.

In other words, the inventions defined in amended claims 17 and 39 are such that the second liquid crystalline phase is able to be surely exhibited in a high-temperature range of 160 to 167℃ by mixing the organic semiconductor compound exhibiting the first liquid crystalline phase of a higher orientational order at a high temperature in a high ratio of 70 to 98 wt% with the organic compound exhibiting the second liquid crystalline phase of a lower orientational order, to cause the organic semiconductor compound exhibiting the first liquid crystalline phase of a high orientational order at a higher temperature in such a high temperature range to be effectively oriented to a high degree. As a result, electric conductivity or the carrier mobility of the conductive thin film is significantly improved.

In contrast, the cited prior art 2 only discloses that 50 to 66 wt% (low ratio) of a charge transport smectic liquid crystalline compound is mixed with 50 to 34 wt % of a nematic liquid crystalline compound, and does not disclose or suggest that features recited in claims 17 and 39 "70 to 98 wt% of the organic semiconductor compound exhibiting the first liquid crystalline phase of a higher orientational order at a high

temperature is mixed with the organic compound exhibiting the second liquid crystalline phase of a lower orientational order", i.e., the nematic phase is exhibited in a high-temperature range to cause the charge transport smectic liquid crystalline compound of a higher orientational order at a high temperature to be effectively oriented to a high degree. Based on the structure disclosed in the cited prior art 2, the organic semiconductor compound exhibiting the first liquid crystalline phase of a higher orientational order at a high temperature is able to be substantially oriented, but is not oriented to a high degree suitable for use in the conductive thin film or the thin film transistor using the conductive thin film, because the nematic phase is not exhibited in a high temperature range. For this reason, the electric conductivity or the carrier mobility of the conductive thin film is not effectively improved based on the structure disclosed in the cited prior art 2.

As should be appreciated, the cited prior art 2 does not disclose or suggest the inventions disclosed in amended claims 17 and 39. The inventions defined in amended claims 17 and 39 have inventive steps over the cited prior art 2.

3 – 3 – 3 Comparison between the inventions of other claims and inventions of cited prior arts

Claims 3 to 7, claims 18 to 22, claims 25 to 29, and 40 to 44, directly or indirectly depend from claim 2, 24 or claims 17 and 39. Since amended claim 2, claim 24, claim 17, and claim 39 have inventive steps over the cited prior art 1 and 2, claims 3 to 7, 18 to 22, 25 to 29, and 40 to 44 also have inventive steps over the cited prior arts 1 and 2.

The inventions defined in claim 46 and 48 are thin film transistors comprising conductive thin films as recited in claims 2 and 17 as semiconductor layers. Since the inventions of amended claims 2 and 17 have inventive steps over the cited prior arts 1 and 2, the inventions of claims 46 and 48 have inventive steps over the cited prior arts 1 and 2.

The inventions defined in claims 50 and 52 are a method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 24 as a method of fabricating a conductive thin film serving as a semiconductor

layer forming a channel layer, and a method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 39 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer. Since the inventions of amended claims 24 and 39 have inventive steps over the cited prior arts 1 and 2, the inventions of claims 50 and 52 also have inventive steps over the cited prior arts 1 and 2.

The inventions defined in claims 54 and 56 are an image display device comprising a conductive thin film as recited in claim 2, and an image display device comprising a conductive thin film as recited in claim 17. Since the inventions of amended claims 2 and 17 have inventive steps over the cited prior arts 1 and 2, the inventions of claims 54 and 56 also have inventive steps over the cited prior arts 1 and 2.

The inventions defined in claims 58 and 60 are such that an electronic device comprising a conductive thin film as recited in claim 2, and an electronic device comprising a conductive thin film as recited in claim 17. Since the inventions of amended claims 2 and 17 have inventive steps over the cited prior arts 1 and 2, the inventions of claims 58 and 60 also have inventive steps over the cited prior arts 1 and 2.

(4) Summary

As should be appreciated from the above, the inventions of claims 2 to 7, 17 to 22, 24 to 29, 39 to 44, 46, 48, 50, 52, 54, 56, 58, and 60 have inventive steps over the cited prior arts 1 and 2.

(5) Conclusion

We believe that the inventions of claims 2 to 7, 17 to 22, 24 to 29, 39 to 44, 46, 48, 50, 52, 54, 56, 58, and 60 have inventive steps. We wish the Examiner to re-examine these claims and to approve inventive steps of the inventions of these claims in international preliminary examination report.

Contents of amendment

(1) Claim 1 on page 91 is cancelled.

(2) "The conductive thin film according to claim 1, which is formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 2 on page 91 is amended to "A conductive thin film which is formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented."

(3) Claim 5 on page 91 is cancelled.

(4) "The conductive thin film according to claim 1, which is formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited in claim 8 on page 92 is amended to "A conductive thin film which is formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented. "

(5) "The conductive thin film according to claim 1, which is formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the

crystallization temperature of the organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 17 on page 93 is amended to "A conductive thin film, which is formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of said organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented. "

(6) Claim 20 on page 94 is cancelled.

(7) "The conductive thin film according to claim 20, wherein said mixed composition is a mixed composition containing 90 to 95 wt% of said organic semiconductor compound." recited in claim 21 on page 94 is amended to "The conductive thin film according to claim 17, wherein said mixed composition is a mixed composition containing 90 to 95 wt% of said organic semiconductor compound."

(8) Claim 23 on page 94 is cancelled.

(9) "The method according to claim 23, which comprises: mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together; and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 24 on page 94 is amended to "A method of fabricating a conductive thin film comprising: mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together; and orienting molecules of the liquid

crystalline organic compound to cause molecules of the nanotube to be oriented."

(10) Claim 27 on page 95 is cancelled.

(11) "The method according to claim 23, which comprises: mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture; and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited in claim 30 on page 95 is amended to "A method of fabricating a conductive thin film comprising: mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture; and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented."

(12) "The method according to claim 23, which comprises: mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound to form a mixed composition; and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 39 on page 97 is amended to "A method of fabricating a conductive thin film comprising: mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of

said organic semiconductor compound to form a mixed composition; and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented. "

(13) Claim 42 on page 97 is cancelled.

(14) "The method according to claim 42, wherein a mixed composition containing 90 to 95 wt% of said organic semiconductor compound is used as said mixed composition." recited in claim 43 on page 97 is amended to "The method according to claim 39, wherein a mixed composition containing 90 to 95 wt% of said organic semiconductor compound is used as said mixed composition."

(15) Claim 45 on page 98 is cancelled.

(16) "The thin film transistor according to claim 45, wherein said conductive thin film is a conductive thin film formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 46 on page 98 is amended to "A thin film transistor comprising a conductive thin film as recited in claim 2 as a semiconductor layer forming a channel layer."

(17) "The thin film transistor according to claim 45, wherein said conductive thin film is a conductive thin film formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited in claim 47 on page 98 is amended to "A thin film transistor comprising a conductive thin film as recited in claim 8 as a semiconductor layer forming a channel layer."

(18) "The thin film transistor according to claim 45, wherein said conductive thin film is a conductive thin film formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than

room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 48 on page 98 is amended to "A thin film transistor comprising a conductive thin film as recited in claim 17 as a semiconductor layer forming a channel layer."

(19) Claim 49 on page 98 to 99 is cancelled.

(20) "The method according to claim 49, wherein said method of fabricating a conductive thin film comprises the steps of: mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together; and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 50 on page 99 is amended to "A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 24 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer."

(21) "The method according to claim 49, wherein said method of fabricating a conductive thin film comprises the steps of: mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture; and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited in claim 51 on page 99 is amended to "A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 30 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer."

(22) "The method according to claim 49, wherein said method of fabricating a conductive thin film comprises the steps of: mixing at least an organic semiconductor

compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound to form a mixed composition; and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 52 on page 99 is amended to "A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 39 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer."

(23) Claim 53 on page 99 is cancelled.

(24) "The image display device according to claim 53, wherein said conductive thin film is a conductive thin film formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 54 on page 100 is amended to "An image display device comprising a conductive thin film as recited in claim 2 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor."

(25) "The image display device according to claim 53, wherein said conductive thin film is a conductive thin film formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited on claim 55 on page 100 is amended to "An image display device comprising a conductive thin film as recited in claim 8 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor."

(26) "The image display device according to claim 53, wherein said conductive thin film is a conductive thin film formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 56 on page 100 is amended to "An image display device comprising a conductive thin film as recited in claim 17 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor."

(27) Claim 57 on page 100 is cancelled.

(28) "The electronic device according to claim 57, wherein said conductive thin film is a conductive thin film formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented." recited in claim 58 on page 101 is amended to "An electronic device comprising a conductive thin film as recited in claim 2 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor."

(29) "The electronic device according to claim 57, wherein said conductive thin film is a conductive thin film formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented." recited in claim 59 on page 101 is amended to "An electronic device comprising a conductive thin film as recited in claim 8 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a

thin film transistor."

(30) "The electronic device according to claim 57, wherein said conductive thin film is a conductive thin film formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented." recited in claim 60 on page 101 is amended to "An electronic device comprising a conductive thin film as recited in claim 17 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor."

CLAIMS

[1] (cancelled)

[2] (amended) A conductive thin film which is formed by mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented.

[3] [4] (original)

[5] (cancelled)

[6] [7] (original)

[8] (amended) A conductive thin film which is formed by mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic semiconductor mixture and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented.

[9] to [16] (original)

[17] (amended) A conductive thin film, which is formed by mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of

said organic semiconductor compound to form a mixed composition and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented.

[18][19] (original)

[20] (cancelled)

[21] (amended) The conductive thin film according to claim 17, wherein said mixed composition is a mixed composition containing 90 to 95 wt% of said organic semiconductor compound.

[22] (original)

[23] (cancelled)

[24] (amended) A method of fabricating a conductive thin film comprising: mixing at least nanotube comprising at least one of metallic nanotube and semiconductive nanotube and a liquid crystalline organic compound having a charge transport function together; and orienting molecules of the liquid crystalline organic compound to cause molecules of the nanotube to be oriented.

[25] [26] (original)

[27] (cancelled)

[28] [29] (original)

[30] (amended) A method of fabricating a conductive thin film comprising: mixing at least a non-liquid-crystalline organic semiconductor compound and a non-liquid-crystalline organic compound to form a liquid crystalline organic

semiconductor mixture; and orienting molecules of the liquid crystalline organic semiconductor mixture to cause molecules of the organic semiconductor compound to be oriented.

[31] to [38] (original)

[39] (amended) A method of fabricating a conductive thin film comprising: mixing at least an organic semiconductor compound having a first liquid crystalline phase in which crystallization temperature allowing crystallization from the liquid crystalline phase to occur is not lower than room temperature and an organic compound exhibiting a second liquid crystalline phase of a lower orientational order than the first liquid crystalline phase within a temperature range that is higher than the crystallization temperature of the organic semiconductor compound so as to contain 70 to 98 wt% of said organic semiconductor compound to form a mixed composition; and orienting the mixed composition in the second liquid crystalline phase exhibited within a predetermined temperature range to cause molecules of the organic semiconductor compound to be oriented.

[40] [41] (original)

[42] (cancelled)

[43] (amended) The method according to claim 39, wherein a mixed composition containing 90 to 95 wt% of said organic semiconductor compound is used as said mixed composition.

[44] (original)

[45] (cancelled)

[46] (amended) A thin film transistor comprising a conductive thin film as recited in claim 2 as a semiconductor layer forming a channel layer.

[47] (amended) A thin film transistor comprising a conductive thin film as recited in claim 8 as a semiconductor layer forming a channel layer.

[48] (amended) A thin film transistor comprising a conductive thin film as recited in claim 17 as a semiconductor layer forming a channel layer.

[49] (cancelled)

[50] (amended) A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 24 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer.

[51] (amended) A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 30 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer.

[52] (amended) A method of fabricating a thin film transistor, comprising a method of fabricating a conductive thin film as recited in claim 39 as a method of fabricating a conductive thin film serving as a semiconductor layer forming a channel layer.

[53] (cancelled)

[54] (amended) An image display device comprising a conductive thin film as recited in claim 2 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.

[55] (amended) An image display device comprising a conductive thin film as recited

in claim 8 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.

[56] (amended) An image display device comprising a conductive thin film as recited in claim 17 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.

[57] (cancelled)

[58] (amended) An electronic device comprising a conductive thin film as recited in claim 2 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.

[59] (amended) An electronic device comprising a conductive thin film as recited in claim 8 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.

[60] (amended) An electronic device comprising a conductive thin film as recited in claim 17 as at least one of a conductive layer and a semiconductor layer forming a channel layer of a thin film transistor.